# EXHIBIT A (AFFIDAVIT OF ERNST R. BERNDT, Ph.D.)

## UNITED STATES DISTRICT COURT FOR THE DISTRICT OF MASSACHUSETTS

| IN RE PHARMACEUTICAL INDUSTRY |
|-------------------------------|
| AVERAGE WHOLESALE PRICE       |
| LITIGATION                    |

MDL 1456

THIS DOCUMENT RELATES TO:

THE CITY OF NEW YORK v. ABBOTT LABORATORIES, INC., et al, S.D.N.Y. 04-CV-06054

And Related County Cases Listed in the First Amended Consolidated Complaint.

Civil Action No. 01-Civ-12257-PBS

Judge Patti B. Saris

AFFIDAVIT OF ERNST R. BERNDT, Ph.D.

| City of Cambridge      | )     |
|------------------------|-------|
|                        | : ss. |
| State of Massachusetts | )     |

Ernst R. Berndt, Ph.D., being duly sworn, deposes and says:

- I am the Louis E. Seley Professor in Applied Economics at the Sloan School of Management, Massachusetts Institute of Technology. I have been a Professor of Applied Economics at MIT since 1980. My qualifications are detailed in a report I previously submitted to this Court entitled "Report of Independent Expert Professor Ernst R. Berndt to Judge Patti B. Saris" dated February 9, 2005 ("2005 Report"). A copy of my Curriculum Vitae is attached as Exhibit A.
- I am currently engaged as an expert by counsel for the Johnson & Johnson Defendants. I am being paid by the Johnson & Johnson Defendants at my standard rate of \$625 per hour, plus reasonable out of pocket expenses.

- 3. The Johnson & Johnson Defendants have asked me to provide the Court with an affidavit setting forth my opinions concerning an issue raised by the Motion for Partial Summary Judgment filed by defendant SmithKline Beecham Corporation, d/b/a GlaxoSmithKline ("GSK") in the New York Counties' AWP case ("GSK's Motion"). More specifically, I have been asked to identify whether certain types of rebates paid by manufacturers should be included in the net price calculations used to compare net prices with reported WACs under what the parties have called the "WAC List Price Test," as described in this Court's June 21, 2007 decision in *In re Pharm. Indus. Average Wholesale Price Litig.*, 491 F. Supp. 2d 20 (D. Mass. 2007) ("2007 Decision").
- 4. As I understand the issue, GSK and the plaintiffs agree that the discounts and rebates that GSK pays to drug *purchasers* (*e.g.*, wholesalers, retail pharmacies and mail order pharmacies) should be included in the relevant net price calculations defined above, but disagree about whether rebates given to entities that *reimburse* providers for drugs (*e.g.*, insurers, PBMs, and other third-party payors) should be included in those net price calculations. GSK maintains that rebates to entities that *reimburse* providers for drugs, *i.e.*, "payors," should *not* be included in the net price calculations, whereas plaintiffs maintain that *all* manufacturer rebates (except rebates to Medicaid programs), *including* rebates to "payors," should be included in those calculations. For the reasons set forth in Section III below, I agree with GSK's position that the rebates it gives to the "payor" entities (including PBMs) that *reimburse* providers for drugs should *not* be included in the net price calculations performed under the WAC List Price Test (or, for that matter, under what the parties have called the "AWP Spread Test").

#### I. RECORD MATERIALS CONSIDERED

5. In forming the opinions expressed herein, I have considered the following materials of record: (1) the 2007 Decision, and (2) the briefs, expert affidavits and exhibits filed by both sides in connection with GSK's motion (which are listed in Exhibit B attached hereto).

#### II. LIMITATIONS ON MY OPINION

- 6. I have been instructed by counsel for the Johnson & Johnson Defendants to accept, without comment, the findings of fact and conclusions of law set forth in the Court's 2007 Decision. As a result, I offer no opinions in this affidavit concerning whether or not liability should be imposed on drugs that fail to pass the WAC List Price Test or the AWP Spread Test.<sup>1</sup>
- 7. I have not reviewed or analyzed GSK's pricing data. Accordingly, I offer no opinions in this affidavit concerning the accuracy of the calculations performed either by Dr. Gaier (GSK's expert) or Mr. Devor (the New York Counties' expert), although I do comment on the categories of rebates that each expert included or excluded in his net price calculations for purposes of applying the WAC List Price Test.
- 8. The opinions expressed in this affidavit relate to brand name drugs such as those at issue in GSK's Motion. I offer no opinions in this affidavit concerning generic drugs.

<sup>&</sup>lt;sup>1</sup> I am aware that the plaintiffs in Class 1 have appealed this Court's entry of judgment in favor of the Johnson & Johnson Defendants, and that AstraZeneca has appealed this Court's entry of judgment in favor of the plaintiffs in Classes 2 and 3.

#### III. MY OPINIONS

## A. Background Concerning Pharmaceutical Sales and Reimbursement

- 9. Brand pharmaceutical manufacturers typically sell self-administered, single-source drugs to wholesalers (or large retail pharmacy chains) at or about the published wholesale acquisition cost (WAC), which in most cases is 16.67% to 20% less than the published AWP.<sup>2</sup> Brand pharmaceutical firms typically offer wholesalers a small "prompt pay" incentive for payments made within 30 days, as well as modest stocking and distribution allowances.
- 10. When wholesalers sell brand-name drugs to retail pharmacies and mail order pharmacies, they typically add a modest mark-up to the price at which they purchased the drug from the manufacturer. Accordingly, the price paid by retail and mail order pharmacies is usually fairly close to WAC.
- In some situations, brand pharmaceutical manufacturers may offer discounts or rebates to certain "downstream" providers that purchase the manufacturer's drugs from wholesalers. In the case of self-administered drugs, the downstream purchaser is typically a pharmacy. The vast majority of pharmacies are retail pharmacies (such as CVS or Walgreens). Mail order pharmacies also purchase and dispense self-administered drugs. Both types of pharmacies (along with physicians, hospitals and other entities that purchase and take physical possession of drugs) are commonly referred to as "providers," inasmuch as they take title to, and administer or dispense (*i.e.*, "provide") drugs to patients.

<sup>&</sup>lt;sup>2</sup> Put another way, the published AWP for brand-name drugs is typically 20% to 25% higher than the published WAC for the same drug.

- 12. After a provider purchases a drug and administers or dispenses it to a patient, the provider typically seeks reimbursement from a "third-party payor" ("TPP"), such as a private insurance company or state Medicaid agency. With limited exceptions, these TPPs do not themselves take title to or purchase drugs. Rather, their function is to reimburse providers for the drugs that the providers acquired from wholesalers or manufacturers. In simple terms, these payors "pay for" the drugs that the providers purchase and then administer or dispense to the patient.
- 13. Pharmacy benefit managers, or "PBMs," are entities that are typically retained by private TPPs (such as insurance companies and employee health plans) to, among other things, administer reimbursement payments to providers such as retail pharmacies on behalf of their TPP clients. The PBMs are typically provided with funds by their TPP clients to finance these reimbursements, and they typically reimburse providers who dispense brand-name drugs to the TPP's insureds or members according to a formula based on WAC or AWP. In performing this reimbursement function, PBMs are simply doing, for their payor clients, what payors do -- that is, they are reimbursing the providers who dispense drugs to patients.
- PBMs may also negotiate with manufacturers for the payment of manufacturer rebates in exchange for placing the manufacturer's drugs on a formulary. These rebates accrue to the benefit of the PBM's TPP clients. As I stated in my 2005 Report, an estimated 70% to 90% of the rebates paid by manufacturers to PBMs are "passed on" to the PBM's TPP clients. 2005 Report at ¶¶ 158-60. Large TPPs sometimes also have their own, internal, pharmacy benefit managers, which negotiate for manufacturer rebates that are paid directly to the TPPs. When PBMs (whether or not they are owned by TPPs) perform

- these reimbursement and rebate-negotiating functions, they are doing so for the benefit of their payor clients and, as such, are performing "payor" functions.
- 15. Separately, PBMs sometimes also operate their own mail order pharmacies, which themselves purchase, take title to, and dispense drugs. These PBM mail order pharmacy operations -- as opposed to the other operations of a typical PBM described above -- do not function like a payor but function more like a retail pharmacy provider, in that they typically purchase brand drugs from wholesalers at close to WAC and dispense them to patients, albeit via mail order.
- 16. The relationships among manufacturers, wholesalers, providers and payors (and how PBMs act on behalf of payors) are discussed at length in my 2005 Report. For present purposes, it is sufficient to note that when payors (including PBMs acting on behalf of payors) reimburse providers for brand-name drugs, they typically do so based on published WACs or AWPs, which typically are formulaically related to one another. The reimbursement amount takes into account the provider's cost of acquiring the drug, as well as other factors relevant to the payor, such as ensuring access to an adequate provider network for their insureds or members.

### B. My Interpretation of the Court's Liability Tests

17. The opinions expressed in this affidavit are based, in part, on my understanding of the Court's reasons for adopting the WAC List Price Test and the AWP Spread Test.

Accordingly, at the outset, I explain my interpretation of those tests so that the Court may assess whether I have properly understood them.

- The WAC List Price Test was based on the Court's interpretation of Federal Trade

  Commission Pricing Guidelines, which state that a published list price will not be deemed fictitious so long as "substantial sales" are made at about that price. Interpreting these guidelines, the Court concluded that "if more than 50 percent of all sales are made at or about the list price, the list price will not be deemed fictitious." 2007 Decision, 491 F.

  Supp. 2d at 105. This test examines all sales to all drug purchasers (e.g., to wholesalers and providers) and determines whether the majority of them were made at a net price that was within 5% of the published WAC.
- 19. The AWP Spread Test was based on the Court's finding that certain payors perceived AWP as a signal for the net prices that providers paid for drugs. In particular, the Court found that knowledgeable payors understood that, for brand-name drugs, published AWPs were generally 20% to 25% higher than reported WACs, and that there is typically some modest discounting by manufacturers below WAC. 2007 Decision, 491 F. Supp. 2d at 40. Thus, the Court concluded that, in general, there was no deception and no liability if the difference between a drug's average selling price and its published AWP was approximately 30% or less. *Id.*, 491 F. Supp. 2d at 94.
- 20. Essentially, I believe the Court intended both of its liability tests to distinguish between those published WACs and AWPs that, when used by *payors* as a metric for reimbursement to *providers*, constituted a reasonably reliable signal for the net prices that *providers* generally paid for the drugs, as opposed to those published WACs and AWPs that did not meet this criterion. Published prices were deemed lawful as long as at least 50% of sales to all drug purchasers were made at a net purchase price that was within 5% of the published WAC (the "WAC List Price Test") *or* as long as the average net

acquisition cost of the providers reimbursed by the relevant payors was within 30% of the published AWP (the "AWP Spread Test"). In other words, the tests provide that a manufacturer is not liable for published prices if either its WACs or AWPs are reasonably tethered to actual market prices paid, on a net basis, by providers that purchase and dispense drugs.

21. The focus of both of the Court's liability tests is on the reported WAC or AWP on the one hand, and the net price paid by drug purchasers, on the other. With respect to the latter, the WAC List Price Test analyzes all sales to wholesalers and providers to determine if the majority of them were made at a net price that was within 5% of the published WAC. The AWP Spread Test focuses on the average net price paid just by providers in the classes of trade reimbursed by the relevant payors.

# C. My Opinions Concerning How the Court's Liability Tests Should Be Applied

- 22. As I understand it, the primary remaining dispute between the plaintiffs and GSK centers on whether the rebates that a brand manufacturer gives to payors (including PBMs when they are reimbursing on behalf of payors), as opposed to the discounts and rebates it gives to wholesalers and providers, should be included in the net price calculations used to measure whether 50% of sales are made within 5% of WAC (the WAC List Price Test).<sup>3</sup>
- 23. In plaintiffs' view, failing to take account of rebates that manufacturers give to payors would "eviscerate the [WAC List Price Test] because it would allow GSK to exclude

<sup>&</sup>lt;sup>3</sup> A related issue arises in calculating the average acquisition costs (or average selling prices) used to measure whether the spread between the provider's net acquisition cost and AWP exceeds 30%. I am advised by counsel, however, that GSK has not based its motion for partial summary judgment on the AWP Spread Test.

from its sales price calculations one of its largest categories of discounts paid *on the basis* of sales." Plaintiffs' Supplemental Memo. at 7-8 (emphasis in original). I understand that GSK counters that rebates given to payors (including PBMs that reimburse retail pharmacies on behalf of payors) have no impact on the net price paid by wholesalers or providers that purchase and dispense drugs -- which GSK maintains is the relevant comparator to the published WAC under the WAC List Price Test. Furthermore, GSK points out that while manufacturer rebates paid to providers may increase the difference between the provider's net acquisition cost and the payors' net cost of reimbursing for drugs (thereby increasing the gap or "spread", all other things being equal), rebates paid to PBMs and other payors have the exact opposite effect -- they serve to narrow the gap (or "spread") between the provider's net acquisition cost and the payors' net cost of reimbursing for drugs.<sup>4</sup>

- 24. In my opinion, plaintiffs' position is inconsistent with the purpose of the WAC List Price

  Test and, if followed, would have the perverse effect of discouraging brand

  manufacturers from paying rebates to PBMs and other payors that serve to *reduce* the

  payors' cost of reimbursing for drugs, and, ultimately, the health care premiums paid by

  consumers. GSK's position, on the other hand, is consistent with the WAC List Price

  Test and its underlying rationale, as I understand it.
- 25. I take it as a given that GSK is motivated to offer rebates to PBMs and other payors because it expects that these rebates will result in formulary placement and increased

<sup>&</sup>lt;sup>4</sup> I understand that GSK also points out, I think correctly, that the "net revenue" *received* by a drug manufacturer for a particular drug -- which accounts for discounts, rebates to both purchasers and payors (including rebates to Medicaid), credits, returns and other adjustments -- is an accounting figure that in no way reflects the net price paid by any wholesaler or provider to acquire a brand manufacturer's drugs and, as such, is irrelevant under the Court's liability tests.

utilization for its drugs. Economists generally regard this sort of competition which reduces the payors' cost of reimbursing for drugs as being beneficial. The rebates that GSK gives to PBMs and other payors have the effect of reducing drug reimbursement costs. All else being equal, such rebates reduce the cost of health care, and should be encouraged.

- Within a reimbursement system based on published WACs or AWPs, discounts and rebates given to payors are quite different from discounts and rebates given to wholesalers or providers. In practice, rebates and discounts have no effect on the published WACs (or the published AWPs) for brand name manufacturers. Thus, payors who choose to base their reimbursement formulae strictly on published WACs or AWPs (without changing the formulae to reflect market discounts or rebates) do not benefit from the discounts and rebates given to wholesalers or providers. In such circumstances, only the wholesalers or providers benefit from the reduced price.
- 27. On the other hand, when manufacturers offer rebates to PBMs and other payors, the payors -- and *not* the wholesalers and providers -- benefit from the rebates. PBMs and other payors can and do use the rebates they receive from manufacturers to offset the costs they incur in reimbursing for drugs. Thus, these rebates partially subsidize the reimbursement payments from the payor to the provider. Again, in my opinion, such rebates are generally beneficial and should be encouraged.
- 28. In addition, manufacturer rebates paid to PBMs and other payors have no effect on the net purchase price paid by any drug provider (with the arguable exception of rebates paid to PBMs that are related to purchases made by PBM-owned mail order pharmacies that

function as drug providers themselves).<sup>5</sup> Such rebates reduce the manufacturer's net revenue, but they have no impact on the net price paid by the wholesaler or provider.

- 29. According to plaintiffs, including PBM and other payor rebates in the WAC List Price

  Test is nevertheless appropriate, and would substantially increase the number of GSK

  drugs that fail the WAC List Price Test. Plaintiffs' Supplemental Memo. at 3. Thus, in

  plaintiffs' view, GSK should incur greater liability and damages under the WAC List

  Price Test because it give rebates to PBMs and other payors, even though these rebates

  reduce the payors' overall reimbursement costs and have no effect on the net price paid

  by wholesalers and providers. In my judgment, the position advocated by the plaintiffs

  would defeat the purpose of WAC List Price Test. I can only assume that manufacturers

  would be less likely to offer rebates to PBMs and other payors if they believed that such

  rebates would result in greater liability and damages under the Court's liability tests.
- 30. As I interpret the Court's WAC List Price Test (as well as the AWP Spread Test), the intent was not to disadvantage payors by discouraging manufacturers from providing payors with rebates that effectively reduce the costs payors incur in reimbursing for drugs. Accordingly, it is my opinion that rebates to PBMs and other payors should not be included in the net price calculations used to assess liability under these tests.

<sup>&</sup>lt;sup>5</sup> I have been advised that GSK's expert has, for purposes of GSK's motion, attempted to *include* all manufacturer rebates attributable to purchases by such PBM-owned mail order pharmacies in calculating the net price paid by providers under the WAC List Price Test, so the proper treatment of such rebates is not currently a matter of dispute between GSK and the plaintiffs.

Ernst R. Berndt, Ph.D.

Sworn to before me this

29 day of June, 2009

Notary Public

MEREDITH FORDYCE
Notary Public
Commonwealth of Massachusetts
My Commission Expires
May 13, 2016





# **CURRICULUM VITAE**

Ernst R. Berndt Louis E. Seley Professor in Applied Economics Alfred P. Sloan School of Management Massachusetts Institute of Technology

Member, Affiliated Faculty of the Harvard-MIT Division of Health Sciences and Technology

Director, National Bureau of Economic Research, Program on Technological Progress and Productivity Measurement

Co-Director, MIT-Harvard Division of Health Sciences and Technology, Biomedical Enterprise Program

19 June 2009

## PERSONAL DATA

| MILT Address v                                 | Home Address             | ************************************** |
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| Crespo, Entre Rios, Argentina<br>13 April 1946 | U.S. Citizen             | eberndt@mit.edu<br>berndt@rcn.com      |

E.R. Berndt, C.V - page 2 -

**Education and Degrees:** 

B.A. (Honors) - 1968 Department of Economics Valparaiso University Valparaiso, Indiana 46383

M.S. (1971) and Ph. D. (1972) Department of Economics The University of Wisconsin Madison. Wisconsin 53706

> Major Field - Public Finance Minor Fields - Demography, **Econometrics**

D. Phil., Honorary (1991) Uppsala University Uppsala, Sweden

Ph.D. Thesis Title:

"The Economic Theory of Separability, Substitution and Aggregation with an Application to U.S. Manufacturing,

1929-1968"

**Thesis Committee:** 

Laurits R. Christiansen, Chair

Arthur S. Goldberger Charles E. Metcalf

**Academic Awards:** 

Christ College Scholar, Valparaiso

University (1965-1968)

National Science Foundation Trainee (1969-1970)

National Science Foundation Fellow (1970-1971 and 1971-1972)

Most Cited Economist Under Age 40 in 1985

Journal of Economic Perspectives Vol. 3, No.4, Fall 1989, p. 143, and The Journal of Economic Education Vol. 20, No.4 Fall 1989, p. 413.

Academic Awards (continued):

Elected Fellow, The Econometric

Society, 1994

Distinguished Alumnus Award,

Valparaiso University, March 31, 1996

Excellence Award in Mental Health Policy and Economics Research, International Center of Mental Health Policy and Economics, Venice, Italy, March 2003 for article published in the March 2002 issue of The Journal of Mental Health Policy and Economics (see item #123 in publications

listed below)

Listed in Who's Who in America

MIT Technology and Policy Program, Faculty Appreciation Award, May 2006

**Current Positions:** 

Professor of Applied Economics, MIT

July 1, 1980 - present

Awarded Louis E. Seley Chaired Professorship in Applied Economics, February 1997

Member. Affiliated Faculty of the Harvard-MIT Division of Health Sciences and Technology, May 2007 – present

Director, National Bureau of Economic Research, Program on Productivity and Technological Change, 2000 – present

Co-Director, Biomedical Enterprise Program, Harvard-MIT Division of Health Sciences and Technology, September 2003 – present

#### **Previous Positions Held:**

Research Economist
Office of Emergency Preparedness
Executive Office of the President
U.S. Government
Washington, D.C.
September 1971 - December 1972

Assistant Professor
Department of Economics
University of British Columbia
January 1973 - June 1976

Associate Professor Department of Economics

University of British Columbia June 1976 - June 1980

Visiting Scholar Department of Economics Massachusetts Institute of Technology July 1977 - June 1978

Visiting Scholar Department of Economics Stanford University January - August 1985

Visiting Scholar Harvard Business School July 1990 - June 1991

Area Head, Economics, Finance and Accounting, MIT Sloan School, July 1992 through June 1995

Visiting Professor of Applied Economics Harvard Medical School, Division of Health Care Policy and Research July 1996- June 1997

Adjunct Professor of Applied Economics, Harvard Medical School, Division of Health Care Policy and Research, July 2001 – June 2005 Co-Director, MIT Center for Biomedical Innovation, January 2005 – June 2008

#### **Other Professional Activities:**

Elected Member and Member, Executive Committee Conference on Income and Wealth National Bureau of Economic Research 1978 – present

Panel Resource Group Member
U.S. National Academy of Sciences
National Research Council
Committee on Nuclear and Alternative
Energy Systems (CONAES)
March 1976 - May 1978

Associate Editor of the Book Review Section, <u>Journal of The American</u>

<u>Statistical Association</u>

1977 – 1981

Editorial Advisory Board Resources and Energy, 1979-2005

Member, Board of Editors <u>Energy Journal</u> 1979 – 1988

Associate Editor

<u>Journal of Business Administration</u>

1982 – 1992

Program Co-Chairman
Second Annual Meeting of the
International Association of Energy
Economists
Churchill College, Cambridge University
Cambridge, England, June 22-24 1980

Research Associate
National Bureau of Economic Research
Productivity and Technical Change
Program, and Health Care Program
1980 - present

# Other Professional Activities (continued):

Conference Co-Organizer (with Zvi Griliches), NBER Workshop on Measurement Issues, Investment, and Productivity
Summer 1983, 1984, 1986 - 1999; with others, 2000 - present

Associate Editor

<u>Journal of Econometrics</u>

April 1985 - February 1991

Associate Editor

<u>Land Economics</u>

April 1985 - February 1991

Member, Editorial Board

Journal of Economics and Management

Strategy

February 1991 - December 1998

Member, Editorial Board <u>Economic Inquiry</u> September 1991 – June 1997

Member
Dean's Advisory Council
College of Business Administration
Valparaiso University
Valparaiso, Indiana
September 1985 – 2003

Conference Co-Organizer (with William Barnett and Halbert White) Third Austin Symposium in Economics University of Texas at Austin May 22-23, 1986

Conference Co-Organizer (with W. Erwin Diewert and Jack Triplett) Jubilee Anniversary of the NBER Conference on Research in Income and Wealth Washington, D.C., May 12-13, 1988

# Other Professional Activities (continued):

Editor

<u>Journal of Productivity Analysis</u> 1987 – 1991

Member, Special Advisory Panel National Science Foundation Science and Technology Centers, 1988

Conference Co-Organizer (with Timothy Bresnahan, Zvi Griliches, and Marylin Manser), NBER Conference on Output Measurement in the Service Sectors, Charleston, South Carolina, May 3-5, 1990

Conference Co-Organizer (with Peter Englund, Bengt-Christer Ysander and Lennart Hjarmalsson), Productivity Growth in the Service Sectors, Uppsala, Sweden, May 22-24, 1991

Member, Advisory Panel National Science Foundation Measurement Methods and Data Improvement Programs, 1990

Economic Consultant and Academic Affiliate
Analysis Group, Inc.
Boston, MA, 1985 - present

Member, Advisory Committee on Service Statistics, Statistics Canada Ottawa, Canada December 1991 – February 2000

Member Christ College, Alumni Advisory Board Valparaiso University, Valparaiso, IN January 1992 – March 2006

# Other Professional Activities (Continued)

Member, Committee of Visitors, Program in Economics, National Science Foundation, July 1992

Member, Research Consortium, Financial Executives Research Foundation, 1992 – 1995

Member, Editorial Board <u>Southern Economic Journal</u> July 1993 – June 1997

Conference Co-Organizer (with Thomas W. Malone and Laurence C. Rosenberg)
"The Productivity Impacts of Information Technology Investments," Charleston,
South Carolina, November 11-13, 1993

Member, External Review Committee, Pennsylvania State University, Department of Economics, March-April, 1994

Appointed Representative of the American Economic Association to the U.S. Census Bureau Advisory Committee 1996 – 2000; co-chairman, 1999 - 2000

Member and Chair, National Bureau of Economic Research, Human Subjects Investigation Review Board, 1998 - present

Member, National Academy of Sciences Panel on the Conceptual, Measurement and Other Statistical Issues in Developing Costof-Living Indexes, 1999 - 2001

Member and Chair, Federal Economic Statistics Advisory Committee, 2000 – 2004; Member, 2000 - present

Member, American Economic Association, Committee on Economic Statistics, 2002 – 2006 Panel Review Member, National Science Foundation, Program on Methodology, Measurement and Statistics, Spring 2003 – December 2004.

Intermittent Detail to the U.S. Food and Drug Administration, Office of the Commissioner, 5600 Fishers Lane, Rockville, MD 20857, October 1, 2003 – June 30, 2004. Appointed Special Government Employee (uncompensated), U.S. Food and Drug Administration, Office of the Commissioner, January 23, 2006 – December 31, 2006; February 12, 2007 – December 31, 2007.

Editorial Board, <u>RAND Forum for Health</u>
<u>Economics and Health Policy</u>, March 2004
– present

Member, Advisory Panel on Outpatient Drugs, U.S. Government Accountability Office, July 2004-September 2005

Member, Editorial Board, <u>Health Affairs</u>, October 2005-present

Member, External Visiting Committee, University of Pennsylvania, The Wharton School, Health Care Policy Program, April 2008

Advisory Committee Member, Social, Behavioral and Economics Directorate, National Science Foundation, May 2009 present

## Publications (in chronological order)

#### **ARTICLES/CHAPTERS/REPORTS:**

- 1. Berndt, Ernst R. and Laurits R. Christensen, "The Internal Structure of Functional Relationships: Separability, Substitution, and Aggregation," <u>Review of Economic Studies</u>, Vol. XL (3), July 1973, pp. 403-410.
- 2. Berndt, Ernst R. and Laurits R. Christensen, "The Translog Function and the Substitution of Equipment, Structures, and Labor in U.S. Manufacturing, 1929-68," <u>Journal of Econometrics</u>, Vol. 1 (1), 1973, pp. 81-114.
- 3. Berndt, Ernst R. and Dale W. Jorgenson, "Production Structure," Chapter 3, in Dale W. Jorgenson, Ernst R. Berndt, Laurits R. Christensen, and Edward A. Hudson, <u>U.S. Energy Resources and Economic Growth</u>, Final Report to the Ford Foundation Energy Policy Project, Washington, D.C., October 1973.
- 4. Berndt, Ernst R., "Forecasting North American Energy Demand: Issues and Problems," in Peter H. Pearse, ed., <u>The Mackenzie Pipeline: Arctic Gas and Canadian Energy Policy</u>, Toronto: McClelland and Stewart, 1974, pp. 71-79.
- 5. Berndt, Ernst R. and David O. Wood, "An Economic Interpretation of the Energy-GNP Ratio," in Michael S. Macrakis, ed., <u>Energy: Demand Conservation and Institutional Problems</u>, Cambridge: MIT Press, 1974.
- 6. Berndt, Ernst R. and Laurits R. Christensen, "Testing for the Existence of a Consistent Aggregate Index of Labor Inputs," <u>American Economic Review</u>, June 1974, Vol. 64, No. 3, pp. 391-404.
- 7. Berndt, Ernst R., Bronwyn H. Hall, Robert E. Hall, and Jerry A. Hausman, "Estimation and Inference in Nonlinear Structural Models," <u>Annals of Economic and Social Measurement</u>, Vol. 3, No. 4, October 1974, pp. 653-665. Reprinted in Herman Bierens and A. Ronald Gallant, eds., <u>Nonlinear Models</u>, Cheltenham: Edward Elgar Publishing, Ltd., 1996.
- 8. Berndt, Ernst R. and David O. Wood, "Technology, Prices and the Derived Demand for Energy," <u>Review of Economics and Statistics</u>, Vol. 57, No. 3, August 1975, pp. 259-268.
- 9. Berndt, Ernst R. and N. Eugene Savin, "Estimation and Hypothesis Testing in Singular Equation Systems with Autoregressive Disturbances, <u>Econometrica</u>, Vol. 43, No. 5-6, September-November 1975, pp. 937-957.
- 10. Berndt, Ernst R., "Reconciling Alternative Estimates of the Elasticity of Substitution," <u>Review of Economics and Statistics</u>, Vol. 58, No. 1, February 1976, pp. 59-68.

- 11. Berndt, Ernst R. and G. Campbell Watkins, "Demand for Natural Gas: Residential and Commercial Markets in Ontario and British Columbia," Canadian Journal of Economics, Vol. 10, No. 1, February 1977, pp. 97-111.
- 12. Jonathan R. Kesselman, Samuel H. Williamson and Ernst R. Berndt, "Tax Credits for Employment Rather than Investment," <u>American Economic Review</u>, Vol. 67, No. 3, June 1977, pp. 339-349.
- 13. Berndt, Ernst R. and N. Eugene Savin, "Conflict Among Criteria for Testing Hypotheses in the Multivariate Linear Regression Model," <u>Econometrica</u>, Vol. 45, No. 5, July 1977, pp. 1263-1278. Reprinted in Omar F. Hamouda and J.C.R. Rowley, eds., <u>Foundations of Probability, Econometrics and Economic Games</u>, Cheltenham: Edward Elgar Publishing Ltd., 1996.
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- 22. Marder, William D., Ernst R. Berndt, Larry Levitt and Joseph P. Newhouse, "A New Tool for Tracking Private Health Expenditures," Cambridge, MA: The MedStat Group, July 11, 2002.

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- 25. Ling, Davina Y.C., Richard G. Frank and Ernst R. Berndt, "Behavioral Health Carve-outs and Psychotropic Drug Spending in Medicaid Populations," Boston, MA: Harvard Medical School, unpublished manuscript, May 2003.
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- Services", Cambridge, MA: National Bureau of Economic Research, Working Paper No. 14345, September 2008.
- 33. Marisa Elena Domino, Ernst R. Berndt, and Richard G. Frank, "The Diffusion of Antipsychotic Medications: Does the Close-Knittedness of Physician Networks Matter?", paper presented at 2009 Annual Meetings of the American Economic Association, San Francisco, California, January 4, 2009.

# Exhibit B

| Document Date | Description   |
|---------------|---|
| 11/24/2008    | Defendant SmithKline Beecham Corporation, d/b/a                   |
|               | GlaxoSmithKline's ("GSK's") Memorandum of Law in Support of       |
|               | Its Motion for Partial Summary Judgment in the New York County    |
|               | Cases   |
| 11/24/2008    | Statement of Undisputed Material Facts in Support of Defendant    |
|               | SmithKline Beecham Corporation, d/b/a GlaxoSmithKline's           |
|               | ("GSK's") Motion for Partial Summary Judgment in the New York     |
|               | County Cases, including the Affidavits of Frederick G. Herold and |
|               | Eric M. Gaier, Ph.D. and all accompanying exhibits                |
| 02/11/2009    | Plaintiffs' Memorandum of Law in Opposition to SmithKline         |
|               | Beecham Corporation, d/ba/ GlaxoSmithKline's (GSK's) Motion for   |
|               | Partial Summary Judgment  |
| 02/11/2009    | Affidavit of Joanne M. Cicala, and all accompanying exhibits      |
| 02/11/2009    | Affidavit of Harris L. Devor and all accompanying exhibits        |
| 02/11/2009    | Plaintiffs' Response to Statement of Undisputed Material Facts in |
|               | Support of Defendant SmithKline Beecham Corporation, d/b/a        |
|               | GlaxoSmithKline's (GSK's) Motion for Summary Judgment in the      |
|               | New York Counties Cases and all accompanying exhibits             |
| 03/04/2009    | Reply Brief of Defendant SmithKline Beecham Corporation, d/b/a    |
|               | GlaxoSmithKline ("GSK") in Support of Its Motion for Partial      |
|               | Summary Judgment in the New York County Cases                     |
| 03/04/2009    | Supplemental Affidavit of Eric M. Gaier, Ph.D. and all            |
|               | accompanying exhibits   |
| 03/18/2009    | Plaintiffs' Sur-Reply Memorandum of Law in Opposition to          |
|               | SmithKline Beecham Corporation, d/b/a GlaxoSmithKline's (GSK's)   |
|               | Motion for Partial Summary Judgment                               |
| 03/18/2009    | Affidavit of Joanne M. Cicala and all accompanying exhibits       |
| 0318/2009     | Supplemental Affidavit of Harris L. Devor and all accompanying    |
|               | exhibits  |
| 06/16/2009    | Plaintiffs' Supplemental Memorandum of Law in Opposition to       |
|               | SmithKline Beecham Corporation, d/b/a GlaxoSmithKline's (GSK's)   |
|               | Motion for Partial Summary Judgment                               |
| 06/16/2009    | Supplemental Affidavit of Joanne M. Cicala and all accompanying   |
|               | exhibits  |
| 06/16/2009    | Second Supplemental Affidavit of Harris Devor and all             |
|               | accompanying exhibits   |